Research Note 85-52

BASIC SKILLS RESOURCE CENTER

AD-A160 395

A REVIEW OF THE LITERATURE ON LEARNING STRATEGIES IN THE ACQUISITION OF ENGLISH AS A SECOND LANGUAGE: THE POTENTIAL FOR RESEARCH APPLICATIONS

J. Michael O'Malley
Rocco P. Russo
Anna Uhl Chamot

InterAmerica Research Associates, Inc.

for

Contracting Officer's Representative
Richard P. Kern

Instructional Technology Systems Training Area
Zita M. Simutis, Chief

TRAINING RESEARCH LABORATORY
Harold F. O'Neil, Jr., Director

DTIC ELECTE OCT 17 1985 A

DTIC FILE COPY

U. S. Army
Research Institute for the Behavioral and Social Sciences

May 1985

Approved for public release; distribution unlimited.

85 10 1 170

U. S. ARMY RESEARCH INSTITUTE
FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency under the Jurisdiction of the

Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

L. NEALE COSBY
Colonel, IN
Commander

A-1

This report, as submitted by the contractor, has been cleared for release to Defense Technical Information Center (DTIC) to comply with regulatory requirements. It has been given no primary distribution other than to DTIC and will be available only through DTIC or other reference services such as the National Technical Information Service (NTIS). The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other official documentation.

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: ARI Research Note 85-52	2. GOVT ACCESSION NO.: AD-A160 395
3. RECIPIENT'S CATALOG NUMBER:	
4. TITLE (and Subtitle): BASIC SKILLS RESOURCE CENTER. A Review of the Literature on the Acquisition of English as a Second Language: The Potential for Research Applications	5. TYPE OF REPORT & PERIOD COVERED: Interim Report Feb. 1982-Sept. 1984
	6. PERFORMING ORG. REPORT NUMBER:
7. AUTHOR(s): O'Malley, J.M.; Russo, R.P.; Chamot, A.U.	8. CONTRACT OR GRANT NUMBER(s): MDA 903-82-C-0169
9. PERFORMING ORGANIZATION NAME AND ADDRESS: InterAmerica Research Associates, Inc. 1555 Wilson Boulevard, Suite 508 Rossly, Va. 22209	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 2Q162722A791
11. CONTROLLING OFFICE NAME AND ADDRESS: U.S. Army Research Institute in the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, Virginia 22333-5600	12. REPORT DATE: May 1985
	13. NUMBER OF PAGES: 50
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office): - -	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release, distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

- -

18. SUPPLEMENTARY NOTES

Zita M. Simutis, technical monitor for the project

Richard P. Kern, contracting officer's representative

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Learning Strategies
English As A Second Language
Second Language Acquisition
Basic Skills

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This review of the literature on the acquisition of English as a second language was the initial step in the identification of learning strategies in the field. It concentrates on cognitive strategies rather than interpersonal communication or affective learning strategies.

A variety of related terms are defined in the review, and a classification scheme is presented to provide a framework for the discussion of the literature. The concluding section highlights research considerations for potential learning strategies.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

FOREWORD

The Instructional Technology Systems Technical Area of the U.S. Army Research Institute for the Behavioral and Social Sciences directs research in learning strategies applications with a special focus on educational technology and links to military education and training. These research and developemnt efforts are aimed at the overall improvement of the Army's Basic Skills Education Program.

The literature review described in this report was the initial step undertaken in the identification of learning strategies related to the acquisition of English as a second language. A variety of terms are defined and a classification scheme is presented to provide a framework for the discussion of cognitive language learning strategies as contrasted with interpersonal communication or affective strategies. Overall, this effort provides direction to research considerations for learning strategies investigations relevant to the Army's English as a second language programs.

DTIC
COPY
INSPECTED
3

A1

EXECUTIVE SUMMARY

A Review of the Literature on Learning Strategies in The Acquisition of English as a Second Language: The Potential for Research Applications

InterAmerica Research Associates, Inc., has developed and operated the Basic Skills Resource Center (BSRC) under contract with the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). The BSRC project has two interfacing components: the design, implementation and operation of an information service; and the implementation and monitoring of an applied research agenda related to the study of learning strategies. This report describes the initial phase of one of the five studies undertaken through the BSRC research component. The study was designed to provide information on applications of learning strategies for English as a second language (ESL) students in the military.

This review of the literature was undertaken as an initial step in the identification of ESL learning strategies. Identification of learning strategies is of particular importance to ESL because of the difficulty students confront in gaining second language proficiency necessary to meet the language demands in education and training situations. Learning strategies for second language learners concentrate on what the students can do to become more effective language learners and what students can do to profit from available instruction.

These influencing factors served to focus the literature review on cognitive learning strategies as contrasted with interpersonal communication or affective learning strategies. Owing to the recency of

learning strategies research in the second language acquisition field, a variety of terms associated with learning strategies are defined and a classification scheme derived from an analysis of the literature review is presented. This scheme provides a framework for reviewing learning strategies derived from research on text processing and second language learning. Within the text processing and language acquisition areas, two broad categories of learning strategies are discussed. These strategy categories, "manipulative" and "metacognitive", are defined in terms of the degree of learner control. The discussion of second language acquisition strategies concentrates largely on learning to speak and understand a new language.

Overall, the empirical studies associated with learning strategies in text processing indicate that extension of these strategies to second language acquisition should be considered and might demonstrate similar effects on learning and retention. Empirical studies of second language acquisition learning strategies have focused on describing learning strategies rather than on identifying variables which contribute to the success of the strategies. There is a need for controlled investigations of learning strategies used in text processing in order to explore the effects on student learning and retention in second language acquisition. In conclusion, the review highlights strategies that are judged to have the most potential for investigation in ESL training settings.

TABLE OF CONTENTS

	Page
Statement of the Problem	3
Definition of Terms	5
- Learning Strategy	6
- Teaching Strategy	7
- Communication Strategies	8
- Learner Characteristics	9
Classification of Learning Strategies	9
Learning Strategies in Text Processing	13
- Manipulative Strategies	13
- Metacognitive Strategies	15
- Discussion	18
Learning Strategies in Second Language Acquisition	19
- Manipulative Strategies	20
- Metacognitive Strategies	25
- Discussion	30
Conclusions	31
REFERENCES	

A REVIEW OF THE LITERATURE ON LEARNING STRATEGIES IN THE ACQUISITION OF ENGLISH AS A SECOND LANGUAGE: THE POTENTIAL FOR RESEARCH APPLICATIONS

In recent years second language researchers have attempted to identify learning strategies that facilitate the acquisition of another language. This body of research has focused on investigating the conditions under which instructional materials may be organized or manipulated for effective learning. The research has been conducted in hopes of delineating procedures that are readily adaptable to classroom practice, easily used by teachers and students, and sufficiently powerful to maintain an impact outside controlled laboratory settings. Depending upon one's perspective, the success of these efforts can be viewed either as negligible or as impressive enough to warrant serious attention.

At least three factors suggest that the accomplishments are modest. First, there is little indication that learning strategies described in the research literature have been adopted in second language classroom practice (Asher, 1977; Gary and Gary, 1981). Second, much of the evidence for learning strategies in second language acquisition is based on practitioner intuition of unknown generality rather than on basic or applied research in classrooms (e.g., Taylor, 1981). And third, most experimental research with learning strategies in second

language learning has been devoted to the keyword method (e.g., Atkinson, 1975; Levin, 1981), a mnemonic technique that has been limited largely to vocabulary acquisition. This limited focus has left the more pervasive concerns in language acquisition such as syntax and sociolinguistic competence largely uninvestigated.

In contrast, there are indications that significant progress has been made in research on learning strategies derived from recent work in cognitive psychology as well as in second language acquisition. Among cognitive researchers, individuals such as Dansereau (1982) and Wittrock (1982) have identified learning strategies for text processing that have potential for application to second language instruction. Comprehension of text and of spoken language entail similar processes (Kintsch and van Dijk, 1978; Sticht, 1975a; Sticht and James, 1973) and may be expected to respond to comparable instructional manipulations.

Among researchers in second language acquisition, Taylor (1981) and Ventriglia (1982) have discussed learning strategies for acquiring language structures on which additional research is clearly needed. To add to this potential, teaching strategies with strong promise for contributing to learning strategies in second language acquisition have been demonstrated in a number of studies, exemplified most successfully by the Total Physical Response method (Asher, 1977) and the delayed oral production approach (Nord, 1980; Postovsky, 1974).

The potential for future investigations to contribute to a firmer understanding of learning strategies in second language acquisition should be evident despite the shortcomings of prior research. In this review, we develop a structure for discussing research in text processing as well as second language learning on the expectation that studies in reading will contribute learning strategies that may be useful in second language acquisition. We focus specifically on studies of secondary school students and young adults that have potential application to learners of English as a second language.

Statement of the Problem

Identification of learning strategies is of particular importance in teaching English as a Second Language (ESL) to adolescents and adults in the United States. There is limited time available for older learners to acquire language skills that will allow them to participate fully in the education or training needed to prepare them to become productive members of our general society. There is also limited opportunity for these individuals to advance beyond unskilled positions if they lack skills in English and the ability to communicate competently with other persons.

English language skills acquired by students in education or training programs must be used later as tools to learn subject matter content or specific training tasks. These skills must support complex learning moreso than social communicative skills acquired in natural interactive contexts (Krashen, 1980; Saville-Troike, 1982), and they

serve as a foundation on which reading skills are later established (Sticht, 1975b). Cummins (1980; 1982) characterizes these types of language skills according to function. The language of social communication, which is highly dependent on interpersonal contexts, is referred to as basic interpersonal communicative skills (BICS). The highly decontextualized language used for academic instructional purposes has been termed cognitive/academic language proficiency (CALP).

Decontextualized language is believed to be related to an individual's underlying cognitive/academic proficiency, which, in the case of older second language learners, has been developed through the medium of the first language. Decontextualized skills rely heavily on literacy, for it is through reading and writing that the more advanced learner acquires and demonstrates understanding of new information. However, oral skills also need to be developed in decontextualized performance, for a student must have academic listening skills in order to understand lectures, explanations, and directions, and must also have speaking skills adequate to answer questions, describe processes, and explain reasons related to the content being studied. The salience of decontextualized skills in educational settings has been affirmed by Saville-Troike (1982) through naturalistic observation of English as a Second Language (ESL) students in grades 2 through 6. In training settings, extensive work by Sticht and his colleagues has highlighted the importance of language use in performing concrete as well as reading tasks in military programs (Sticht, 1975a; 1975b; Sticht and James, 1973; Sticht, Beck, Hauke, Kleiman, and James, 1974).

The importance of decontextualized language in education and training situations has led us to focus this review on cognitive learning strategies as contrasted with interpersonal communication or affective learning strategies. We begin by defining a variety of terms associated with learning strategies, including items not covered in the literature review, but often confused with issues on which we will focus the discussion. A classification scheme derived from our analysis of the literature serves to structure the remainder of the review. Within this framework, we first consider learning strategies derived from research on text processing, followed by a discussion of learning strategies presented in the literature on second language learning. The discussion of second language acquisition concentrates largely on learning to speak and understand a new language. Within the reading and second language acquisition areas, we discuss two broad categories of learning strategies defined in terms of the degree of learner control, "manipulative" and "metacognitive" strategies. In the concluding section of the review, we highlight strategies having the most potential for investigation in the settings of interest to us and identify research issues that can be addressed.

Definition of Terms

A number of definitions are required to clarify the scope of this literature review and to indicate the specific operations being discussed. A wide range of cognitive and learning operations has been designated as "strategies," and definitions provided for these

operations often have been inconsistent. In formulating definitions used here, we have drawn upon the work of others specifically in the literature emerging out of second language acquisition and analysis of textual materials in cognitive psychology. We first identify the major concept on which we focus the review, learning strategies, and then define three additional terms, teaching strategies, communication strategies and learner characteristics, to clarify areas we will not highlight in the literature discussed.

Learning Strategy. A learning strategy can be defined as any set of operations or steps performed by a learner that will facilitate the acquisition, storage, retrieval, or use of information (Dansereau, 1982; Rigney, 1978). Learning strategies are intended for independent use by learners but may be used initially under the direction of a teacher. The strategy may apply to processing prose textual materials or to speaking and understanding involved in second language acquisition. The strategy may have direct impact on the way in which the learner organizes or treats materials during the learning task, but may also impact on what learners do independently of specific materials or learning tasks. Strategies may be used to process main ideas for comprehension, or they may be used to acquire facts as in memorization. Some examples identified in the literature include:

- Learner Attention and Motivation -- Dansereau's (1982) motivational approaches serve as one example, including planning, concentration, monitoring, and cooperative training.
- Textual Materials -- selected strategies include those focusing on comprehension such as Wittrock's (1982) generative learning, Dansereau's (1982)

primary learning strategies, and Jones' (1980) strategies for use with mastery learning. They also include those focusing on details or facts required in memorization, as with Levin's (1981) use of mnemonics.

- o Second Language Acquisition -- learning strategies that may be used to develop linguistic and sociolinguistic competence include mnemonics (Levin, 1981), transfer (Corder, 1981; Ventriglia, 1982), and self-monitoring strategies (Krashen, 1980).

Teaching Strategy. A teaching strategy is any set of operations or steps performed by a teacher that will facilitate the learner's acquisition, storage, or use of information. The student may or may not participate overtly in the teaching strategy. Teaching strategies are not intended for independent use by learners although some learners may use the strategies in the absence of a teacher either alone or in the company of other learners. Teaching strategies will be discussed in this review only if they have the potential to be adopted as a strategy for learners to use independently of teachers. Numerous teaching strategies have been discussed in the literature on instruction that are not pertinent to this review (e.g., Brophy, 1979; Good, 1979; Rosenshine, 1979) because the principles derived are not intended for use by students.

As with learning strategies, teaching strategies may be used in prose processing or language instruction, they may impact on the material or on the learner, and they may be used to process main ideas or to acquire factual details. Selected examples in the literature on prose processing and second language acquisition include teaching strategies that focus on:

- Learner Attention and Motivation -- motivational strategies by McCombs (1982) serve as one example. These include skill training materials which focus on the development of strategies for self-management, personal responsibility, and positive self-control.

- Textual Materials -- Jones and Smart's (1982) strategies serve as a prime example in which organization and emphasis in the prose material are under the direction of the teacher or, in this case, the curriculum designer.

- Language Acquisition -- representative teaching strategies include presentation of syntactic groupings or repeated oral presentations of complete passages as suggested by Taylor (1980), and the delay of oral production suggested by Nord (1980) and others (e.g., Asher, 1982).

Communication Strategies. These strategies derive largely from observations of natural speech of second language learners. A communication strategy is an attempt to negotiate an agreement on meaning between two or more persons under conditions when the speaker desires to communicate but believes the linguistic or sociolingustic structure required to communicate meaning is either unavailable or not shared with the listener (Corder, 1981; Tarone, 1981). In the process of negotiating the meaning, the speaker may use word or phrase modifications or substitutions, approximations, mimicry, or even total avoidance of communication on the topic. Although it is possible that these communication strategies may lead to learning, it is not the principal purpose of the strategy to facilitate learning but to facilitate communication of meaning or intent. Accordingly, because their focus is not on learning, these communication strategies are not covered in our review.

Learner Characteristics. Learner characteristics appear to be instrumental in promoting learning based on data produced in correlational studies. Such characteristics are of incidental interest in our review unless learners can be trained to adopt them as strategies. The characteristics of interest here typically would be considered acquired characteristics as contrasted with inherent characteristics of persons, because these characteristics are often promoted as traits to be emulated by less efficient learners. Examples specifically in the second language acquisition literature are Fillmore's sociability, or preference for play situations requiring language production; and flexibility, or a straight-forward approach to problem-solving (Cathcart, Strong, and Fillmore, 1980; Fillmore, 1976).

Classification of Learning Strategies

A classification scheme will prove useful in establishing an overview of learning strategies and their applications to text processing and second language acquisition. Such a scheme will be most useful if it is able to differentiate learning strategies in which materials are manipulated for presentation to students, from those in which students apply specific techniques to the materials or are helped to become aware of variables that enhance learning. A classification strategy that serves this purpose will conveniently subsume as a manipulative approach those teaching strategies that can be used independently by students. A classification scheme developed by Ford (1982) to describe learning strategies in text processing is useful for

describing learning strategies in second language learning. Ford proposed two broad categories of learning strategies (which, to illustrate our point about inconsistencies in use of terms, he referred to as "teaching strategies"):

- o Manipulative Approaches -- manipulating the way in which information is presented to influence the individual's learning processes, such as varying the presentation of information, the sequencing, the use of inserted questions, and the use of advance organizers.

- o Metacognitive Approaches -- teaching the individual specific techniques to apply, or helping the person to become more generally aware of factors that influence learning, including

  - specific retrieval strategies, in which the process used to encode information is used as a retrieval requirement, as in networking,

  - elaboration strategies, in which a person adapts information and relates it to other concepts in memory, as with mnemonics, and

  - transformations, where the individual actively integrates new information with existing knowledge by following instructions to read for meaning rather than for facts and details.

Ford also describes more general self-awareness metacognitive techniques in which students are made more generally aware of learning processes, particularly in complex learning tasks. These include teaching the person general principles of how to evaluate their status with regard to the basic components involved in learning.

A relatively simple adaptation of Ford's classification scheme is presented in Table 1, showing the two types of learning strategies Ford suggests, and two types of activities relevant to our interests

TABLE 1

Classification of Learning Strategies

Activity	Learning Strategies	
	Manipulative	Metacognitive
Text processing	Advance organizers Characteristics of text	Elaboration (mnemonics) Retrieval strategies (networking) Transformations (generative strategies) Self-management (relaxation, planning, and concentration)
Oral language acquisition	Advance organizers Groupings Delayed production Use of imperatives Requiring overt responses Cloze procedures	Note-taking Elaboration Transfer Recombination Self-monitoring Introspective/retrospective strategies Cooperative strategies

-- text processing and second language acquisition. In the cells of this schema are specific learning strategies identified in the literature. From inspection of the cells of the classification scheme, it is evident that a comprehensive range of learning strategies fits comfortably within the classification scheme. We have added to Ford's cell entries for text processing by dividing manipulative strategies into advance organizers and characteristics of the text. We have also grouped Wittrock's generative approach to reading (Wittrock, 1974; 1982), which Ford neglected to discuss at all, under metacognitive transformational approaches. We have selected a representative range of learning strategies in second language acquisition and extended Ford's scheme to cover this new area after having divided the strategies into manipulative and metacognitive strategies based on an analysis of their procedures.

In the sections which follow, this classification scheme will be used to organize the discussion of research associated with the various learning strategies. We analyze selected learning strategies that previously have only been applied in text processing, and a number of learning strategies used in second language acquisition. Our objective is to identify strategies that can be used independently by learners to analyze and organize instructional materials with a resultant increment in second language learning. Thus, we are interested in manipulative strategies that can be adapted as metacognitive strategies, and in reading strategies that can be adapted for second language acquisition.

Learning Strategies in Text Processing

The majority of empirical work on learning strategies has been conducted on native language text processing. The research derives from the emphasis in cognitive psychology on memory processes and learning, and from the focus on procedures designed to facilitate acquisition and storage of information. This tradition of research is empirical in nature and frequently contains experimental comparisons of individual learning strategies with control conditions. Further, the tradition is pragmatic and assumes that student performance can be improved. Studies are therefore designed, on the one hand, to test models of text processing or learning, and on the other hand, to determine the most effective ways to maximize learning for any given materials or learner. In the discussion that follows, we identify a number of learning strategies used in text processing, differentiating them into manipulative strategies and metacognitive strategies, as illustrated in Table 1.

Manipulative Strategies. The application of manipulative strategies to text processing results in modifications of text organization or style that are designed to enhance learning and retention. The student is expected to respond to these cues by following the organization and emphasis given to selected aspects of the materials, thereby focusing the student's attention on items considered important for future retention and application. In addition to acting as attention-focusing devices, some of these strategies link prior knowledge to new information presented in the text. Considerable success has been found in using a number of these strategies.

The characteristics of text have been shown to influence comprehension and retention in a variety of studies. These characteristics are generally supposed to focus student attention on important points in the narrative and thereby enhance retention. Studies demonstrating the success of these strategies have concerned hierarchical organization of a passage (Tenerbaum, 1977), provision of a structural outline of a passage (Glynn and DiVesta, 1977), insertion of paragraph headings into written text (Doctorow, Wittrock, and Marks, 1973), and embedding definitions of unfamiliar words into a text (Wittrock, Marks, and Doctorow, 1975). Additional characteristics that have been shown to influence comprehension and retention are pre- and postquestions (Boyd, 1973; Boker, 1974; Sagaria and DiVesta, 1978), reader-formulated questions (Ross and Killey, 1977), and specification of goals and objectives (Duchastel, 1979; Duell, 1974; Kaplan and Simmons, 1974; Royer, 1977).

A series of studies concerned with advance organizers was prompted by Ausubel's (1960; 1968) suggestion that prior knowledge of ensuing text will enable the reader to subsume new information under existing categories of meaning. The studies have yielded mixed results and have been subject to methodological criticism due to failure to control for important extraneous variables (Faw and Waller, 1976). However, additional work in this area has led to the conclusion that advance organizers improve learning at higher levels of abstraction (Mayer, 1979), while failing to improve retention of factual information (Barnes and Clawson, 1979). This is consistent with the logic of the approach, which emphasizes organizing principles and interrelationships.

Metacognitive Strategies. Students using metacognitive strategies apply specific techniques to learning tasks that enable them to retain facts or general information. Alternatively, they may analyze the conditions that influence their learning or retention and manipulate these conditions to improve learning. At least four metacognitive strategies have been identified in the literature on text processing: elaboration, retrieval strategies, transformations, and self-management.

The use of elaboration is involved when individuals adapt new information as a means of linking it to associations already contained in memory. For example, a person may modify new information to integrate it with easily recalled picture associations or certain well known phrases. Most of the research conducted in this area has been concerned with first language vocabulary acquisition in the course of text processing in which mnemonic strategies are used to develop required associations. Levin and his colleagues (e.g., Levin, 1981; Pressley, Levin, and Delaney, 1982) define mnemonic techniques as involving a physical transformation of materials that enhances their learning and retention. The technique on which most of their work has been conducted is the keyword method, a two-stage process in which the student forms a stable association between the new word and a "keyword" (a more familiar word that is acoustically similar to the new word), and then forms an association between the keyword and the definition of the word to be learned. There are variants of the approach for second language acquisition, as will be discussed below,

and for varying content (Levin, Kessler, Miller and Bartell, 1981; Levin, McCormick, and Dretzke, 1981; Levin, Shriberg, Miller, McCormick, and Levin, 1979), age of students (Delaney, 1978), and size of instructional groupings (Pressley, Levin, Digden, Bryant, McGivern, and Ray, 1982). Throughout this research, Levin and his co-workers have been able to demonstrate that the technique, when administered individually to students, produces memory facilitation in comparison to such strategies as simple repetition, contextual analysis, sentence construction (Levin and Pressley, in press), imagery construction, synonym construction, and copying (Pressley, Levin, Kuiper, Bryant, and Michener, 1981). However, they have been unable as yet to extend the technique except on a limited basis to use with large groups of the usual classroom size. Further, considerably more work is needed before confidence can be expressed in the transfer of mnemonic techniques to new tasks (Griffith, 1980; Weinstein, 1978).

Students use <u>retrieval strategies</u> in metacognition when they apply specific techniques that enable them to gain access to information previously stored in memory. Relatively little work has been conducted in training students to use conscious retrieval strategies except for work with children using materials that are unrelated to academic topics (Dansereau, 1978). In a retrieval strategy proposed by Dansereau, students use a "network analysis" in which they analyze text materials into concepts and relationships between concepts. When asked to retrieve information, students plan out the structure their answer will take using concepts and relationships to represent the information called for. The retrieval strategy is to search memory

looking for concepts and relationships in the stored information that match the information desired for the answer. Dansereau has developed a comprehensive set of strategies of which the retrieval strategy is only one route to increasing learning and retention (Dansereau, 1978; Dansereau, 1982; Dansereau, Actkinson, Long, and McDonald, 1974; Dansereau, Long, McDonald, and Actkinson, 1975; Dansereau, Long, McDonald, Actkinson, Ellis, Collins, Williams, and Evans, 1975). Some of the other components of Dansereau's approach will be discussed below.

A third metacognitive learning strategy is to conduct transformations of textual material through actively integrating new information with existing knowledge. Although Ford (1982) noted that these approaches are not consistently successful, he failed to acknowledge the extensive work in this area performed by Wittrock and his colleagues. Wittrock (1974) has identified a model of "generative" learning which states that reading comprehension occurs when readers actively build relationships between the text and their knowledge and experiences, and among the different parts of the text. According to this model, teachers can facilitate reading comprehension by inducing readers to attend to the text, to relate their knowledge and experiences to it, and to build associations, abstractions, and inferences from it. Readers may also do this independently of a teacher. The associations and relations can be generated through verbal representations (i.e., text-relevant summary sentences, headings, inferences, main ideas, critical comments and evaluations) and can be constructed through imaginal representations (i.e., pictures, images, graphs,

illustrations, diagrams, and drawings). Numerous research studies have supported this model of generative learning (Bull and Wittrock, 1973; Doctorow, Wittrock, and Marks, 1978; Wittrock, Marks, and Doctorow, 1975). Other transformations of textual material that have been shown to influence learning are note-taking (Peper and Mayer, 1978), construction of a paragraph about sentences that have been read by the learner (Paris, Lindauer, and Cox, 1977), and drawing simple pictures of the meanings of words (Bull and Wittrock, 1973).

A final metacognitive strategy that has been shown to influence learning is <u>self-control</u> through relaxation, planning, and concentration. For example, Dansereau differentiates learning strategies into primary learning strategies and support strategies. The primary set includes strategies for acquiring and storing information (comprehension-retention), and strategies for outputting and using stored information (retrieval-utilization). Support strategies concern self-control and include a focus on goal setting and scheduling, concentration management, and monitoring and diagnosing the progress of learning. The overall intent is to assist learners in developing improved acquisition and in providing learners with in-depth training on a broad spectrum of strategies.

<u>Discussion</u>. The variety of empirical support for both manipulative and metacognitive strategies in text processing indicates that extension of these strategies to second language acquisition should be considered. The parallel between comprehension processes in reading and in second language learning might have similar effects on learning

and retention. For example, manipulations of the organization of oral text to reveal internal emphases and structure would be expected to improve student learning and retention. Further, training students to become acquainted with approaches for elaborating and transforming orally presented information, among other metacognitive strategies, should provide them with the techniques to retain both vocabulary and principles being presented. As will be seen, some of the learning strategies used in text processing have already been adopted in second language acquisition, while others used in second language acquisition are totally unique to that area.

Learning Strategies in Second Language Acquisition

The foundation of learning strategy research established by cognitive psychologists in text processing has not been matched by research in second language acquisition. Whereas cognitive psychologists have focused their research efforts on instruction using experimental techniques, second language acquisition researchers have largely focused on natural language learning in school or non-school settings using non-experimental research techniques. Often these non-experimental techniques are used to derive suggestions for instruction but these tend to be based on incomplete evidence. Further, researchers in second language acquisition have debated the utility of teaching settings as an appropriate context where language should be learned (e.g., Krashen, 1980; Schumann, 1980), and have thereby assumed a somewhat pessimistic stance concerning the potential success of second language teaching.

Despite these differences in orientation and approach, both cognitive and second language researchers view learners as generative and instrumental in acting upon the learning materials, rather than as passive recipients of information. This common focus is essential for a discussion of learning strategies to proceed, since many learning strategies purport to provide learners with a varied repertoire of activities that can be applied independently depending on the type of materials, the learning task, and the objectives for learning. In the following sections, we discuss a variety of learning strategies for second language acquisition under the broad parameters of manipulative and metacognitive learning strategies.

Manipulative Strategies. The use of manipulative strategies in second language acquisition determines the organization, sequencing, or substance of information presented to students. The student's experience with the new language is determined by these strategies, which are under control of a teacher. Often the types and timing of responses the student is expected to make are determined by the strategy as well. The literature on second language acquisition is replete with variations of manipulative learning strategies, derived largely out of practitioner experience. These include repetition/imitation, memorization/recall, delayed oral production, cloze procedures, and advance organizers.

Teacher-directed repetition/imitation tasks have been the mainstay of audiolingual methodology. In these techniques, the student repeats vocalizations following a model in order to develop second language

proficiency through conditioning and habit formation (Chastain, 1971). However, recent methodological approaches have rejected reliance on teacher-directed repetition drills because they have not been successful in developing communicative competence (Asher, 1979; Curran, 1976; Galyean, 1977; Gattegno, 1972; Terrell, 1981). Spontaneous learner-generated repetition/imitation learning strategies, nevertheless, have been reported in natural learning environments (Fillmore, 1980; Hakuta, 1975). Learners apparently repeat basic sentences with minor variations either as monologues or in play situations as a way of internalizing a language structure they wish to learn.

Elicited imitation tasks have been used in both first and second language acquisition (Dale, 1976; Naiman, 1974). Sentences to be imitated must be longer than a sequence that can be held in short term memory in order for this technique to elicit language samples that reflect a learner's current level of proficiency (Eisenstein, Bailey, and Madden, 1982; Slobin and Welsh, 1973). The learner must process the meaning of the sentence in order to be able to repeat it. The repetition then becomes a reformulation rather than an exact imitation, and this reformulation will be based on and limited to the grammatical rules known by the individual.

The use of memorization/recall is a simple strategy that underlies much of the factual information that people learn. The strategy relies upon rote memory and can be initiated either by the learner or by the teacher. Some syntactic structures may be learned as memorized

chunks and applied to appropriate situations. The strategy is often relied upon even when it is inappropriate due to lack of familiarity with more sophisticated strategies.

Delayed oral production is an initial silent period during which learners listen intensively to the new language before attempting speech (Krashen, 1980). Experimental studies have indicated that initial emphasis on listening comprehension and delay of speaking contributes positively to later speaking fluency (Nord, 1980; Postovsky, 1974). Gary and Gary (1981) proposed a restructuring of second language curricula using a comprehension-based language model that would provide initial second language instruction in listening and reading comprehension for an extended period, followed by the introduction of writing, and finally speaking.

Elements of this strategy have been developed by Asher into a fully articulated instruction approach, the Total Physical Response method (Asher, 1969a; 1969b; 1972; 1977; Asher and Garcia, 1969; Asher, Kusodo, and De La Torre, 1974; Asher and Price, 1967). Delayed production is only one component of the entire method, which includes at least two additional features. First, as the name "total physical response" implies, students respond overtly while learning to understand relatively simple but complete sentences spoken by tne teacher. Following extensive practice to minimize errors during learning, these sentences may be combined and thus become more complicated in later stages of learning. Second, sentences to which students respond must be imperative (pick up the ruler) rather than

declarative (this is a ruler), thereby assuring physical involvement at each stage of learning. Asher reasons that the physical involvement of learners in language acquisition parallels the way in which the first language is acquired. Furthermore, physical response involves the right brain in learning, thereby entering learned materials into long-term memory more readily. Delayed production is involved because students are never pressured to speak, but develop the desire for language production naturally. Asher cites numerous studies demonstrating the effectiveness of the strategy in producing second language acquisition with both children and adults.

The Natural Approach (Terrell, 1980) also employs instructional techniques that delay oral production and simulate the natural acquisition process of language. An initial silent period in which listening comprehension is developed through a combination of physical responses and modified teacher speech is followed by the eventual emergence of student speech. The teacher accepts all attempts by the learners to communicate, even if these are expressed incorrectly or in the first language.

Cloze procedures have been used by teachers on both written and oral texts to provide students with practice in prediction and inference skills (Streiff, 1981). A cloze exercise omits selected words throughout a passage, and students are required to insert either the exact missing word or one that is appropriate semantically and grammatically. The words omitted can be selected to represent a range of grammatical skills and comprehension requirements. Cloze tasks are

believed to demand integrative language learning strategies, since students must bring to the task all that they have learned about the second language in structure, lexicon, morphology, and pronunciation/spelling (Aitken, 1977).

Advance organizers have been used in second language acquisition following their adoption from use in text processing (Chastain, 1976). Taylor (1981) has described the use of advance organizers throughout five stages in developing listening comprehension in acquiring English as a second language. In the first stage, beginners can be taught to listen for intonational qualities of English sentences and to perceive phonological contrasts (see also Chamot, 1977). At the next stage, even though students have only partial understanding of spoken language, they are encouraged to tolerate the ambiguity and to construct as much meaning as possible from the information they are able to comprehend. In the third stage, students learn chunking strategies (see also Ventriglia, 1982) so that they can hold recognized syntactic structures in short term memory while trying to determine the remainder of the message. At the fourth stage, students preview the entire passage one or more times prior to being provided with other advance information such as vocabulary lists. By the fifth stage, students only need to be provided topic-related vocabulary appropriate to new contexts in which previously learned passages are presented. Brown (1978) also suggests that students can learn to use previous knowledge and experience to predict what is most likely to be said.

Metacognitive Strategies. In contrast to manipulative strategies, where the student has no control over the organization or sequencing of instruction, metacognitive strategies provide the student with either specific or general techniques that can be applied with a variety of materials. The student can use these strategies independently of a teacher, and assumes an analytic and controlling position over the learning setting. The specific strategies that have been discussed of this type are note-taking, elaboration, transfer, recombination, self-monitoring, introspective/retrospective strategies, and cooperative strategies.

Note-taking is a common strategy in secondary and college classrooms for remembering information presented orally. Generally note-taking is considered a learner-generated strategy, and learners have traditionally developed their own individual note-taking styles of abbreviated language. Research studies on note-taking indicate that oral information is recalled better when it is written down in some form (Howe, 1970; Weiland and Kingbury, 1979). Instruction on specific note-taking techniques is rare, but has recently been developed with ESL instruction materials (Dunkel and Pialorsi, 1982; Yorkey, Barrutia, Chamot et al., in press).

One of the few learning strategies on which empirical studies have been conducted in second language acquisition is elaboration. These studies have concentrated on mnemonics as with text processing and have been represented most thoroughly by studies of the "keyword" method (Atkinson, 1975; Atkinson and Raugh, 1975; Delaney, 1973;

Pressley, Levin, and Delaney, 1982; Raugh and Atkinson, 1975). In second language acquisition, this strategy involves forming a mental image associating the meaning of the unfamiliar vocabulary word to a familiar keyword homophone. The mental image may be either a meaningful phrase or a picture that serves to form the connection. Examples of a keyword mnemonic association for a Spanish speaker learning English as a second language would be the following:

- To learn the meaning of the English word pan, a Spanish word that looks and sounds the same but has an unrelated meaning could be used as an interactive visual cue to trigger the correct English meaning. A picture of a load of bread (pan = bread in Spanish) standing upright in a pan would help a student remember the meaning of the English word.

- To learn the English word library, which has a different meaning than its Spanish cognate libreria (bookstore), a meaningful sentence could be constructed to provide a mnemonic cue to the English meaning. En esta libreria no se venden libros (In this library, i.e. bookstore, books are not sold).

Most successful demonstrations of the keyword method have been confined to individual presentation of the treatment condition. However, one of the few successful demonstrations of the keyword method with small groups and classroom-size groups was with second language acquisition (Levin, Pressley, McCormick, Miller, and Schriberg, 1979).

The application of transfer strategies can assist learners in acquiring new information through searching for common elements in the first and the second language. In learning theory, transfer is the

use of previously acquired concepts and schema to aid the integration of new concepts into existing or related conceptual frameworks. While audiolingual second language teaching was more commonly practiced, transfer was termed interference, and was seen as a negative influence from the first language that should be eradicated through the imposition and practice of new language habits (Chastain, 1976). Recent second language investigators have preferred to stress the positive aspects of transfer from the known language to the language being learned. Thus, Corder (1981) sees transfer as a resource expansion strategy, and Ventriglia (1982) describes it as a bridging strategy that can be facilitated by the teacher through the use of concrete and meaningful representations to accompany the presentation of second language items related to what the learner already knows in the first language.

Recombination is the process by which the learner puts together familiar elements of a language in producing novel sentences to express meaning. Termed variously as a process of creating (Ventriglia, 1982) or of creative construction (Dulay and Burt, 1975), this universal approach to both first and second language learning implies the formulation and application of linguistic rules that generate non-memorized, meaningful strings of language. The language learner is constantly forming hypotheses about how the new language works, trying them out, comparing the result with models provided by adult or native speakers, and modifying production to resemble the model as closely as the person's level of proficiency permits.

Self-monitoring is a student-generated strategy that acts as a correcting device on language output (Krashen, 1980). The strategy typically is used to analyze language production during writing, and is used primarily to adjust verb tenses or other grammatical features of language to coincide with known practice. The types of adjustments made in language production tend to be based more on classroom learning rather than informal exposure to the language. This type of conscious adjustment is uncommon in oral language production because the resultant delays in speaking interfere with communication more than the grammatical errors. As a learning strategy generated by students, self-monitoring apparently is of limited usefulness in second language acquisition. But neither is teacher correction of grammatical usage particularly effective (Krashen, 1980). However, teacher-generated monitoring techniques can be applied to written production through teaching of editing and proofreading skills.

In the use of introspective/retrospective learning strategies, students are encouraged to reflect upon the process of language learning as they are acquiring a second language. This strategy has been deployed in a number of ways. Students in one investigation were asked to think aloud while performing a language task in order for the teacher to determine the learning strategies that were being used (Hosenfeld, 1973). In an alternative approach, students were requested to keep journals or language diaries to produce introspective information about learner strategies, cognitive style, and affective factors. A number of researchers in linguistics and language acquisition have kept personal diaries of their second

language learning experiences as a way of identifying their own learning strategies (Bailey, 1980; Rivers, 1981; Schumann, 1980; Schumann and Schumann, 1977). Teacher/researcher-generated language learning journals have been kept as an introspective record of a child's linguistic experiences and learning strategies in an immersion experience (Chamot and Chamot, 1983). Further, dialogue journals as written personal communication between teacher and individual students have provided insight into learning processes and strategies (Gutstein, Kreeft, and Meloni, 1982; Staton, Shuy, and Kreeft, 1982).

Various types of cooperative learning strategies have been found successful in developing second language proficiency. By listening as a group and then pooling information understood, students were able to reconstruct most of a listening passage previously not understood by individual students (Telatnik, 1979). Paired and group work is a feature of instructional materials designed to develop communicative competence (Mellgren and Walker, 1980; Walker, 1983; Yorkey et al., in press). Small group task-oriented communication activities are effective ways to practice speaking skills (Chamot, 1979). Peer prompting, in which a less proficient learner works with a more proficient one, has been suggested as a strategy for promoting language growth (Ventriglia, 1982). In one study conducted by Fillmore (1976), Spanish speaking children were paired with proficient English speakers so that they could learn naturally from peer models. A variant of the cooperative learning approach is community language learning (Curran, 1976), a humanistic second language teaching method that uses counseling psychology techniques. The focus is on shared,

task-oriented activities in which the teacher acts as facilitator, translating from the first to the second language when necessary.

Discussion. The second language acquisition literature has been rich with learning strategies intended to improve the ability of students to acquire and retrieve language components and structures. Some of these strategies have parallels in learning strategies explored in text processing, such as advance organizers, mnemonics, and transformations. The fact that these strategies have been supported empirically in text processing does not necessarily mean that similar findings would result from studies in second language acquisition. But opportunities for further exploration are evident. Other strategies deal more with oral language phenomena and are unique to second language acquisition, such as delayed oral production, use of imperatives, and cooperative learning. Although a few of these strategies have been supported by controlled research, in general there has been little effort to conduct research in which variables associated with the success of these strategies are explored. What is interesting about two particular strategies on which controlled research has been conducted -- mnemonics and delayed oral production -- is that they have been targeted on altogether different skills: vocabulary and general communicative skills. The two strategies therefore would be highly complementary if explored together in a controlled setting.

Conclusions

Throughout this review, we have been concerned with identifying research needs for investigations of learning strategies in second language acquisition. In order to develop a broad understanding of learning strategies in second language learning, we have surveyed the use of learning strategies in text processing on the expectation that the similarity of receptive processes in comprehending spoken and written language would make some of the strategies found to be useful for reading useful in learning a new language. In conducting the review, we applied a framework initially established for reading materials to the literature in second language acquisition. Within this framework, we explored the use of manipulative strategies to identify possible approaches that could be used as a metacognitive strategy by students.

The different traditions of conducting inquiry in reading and in language learning have apparently produced altogether different types of support for the use of learning strategies. Whereas support for learning strategy applications in reading is drawn from controlled experimental studies in cognitive psychology, support for using learning strategies in the second language learning literature is based on practitioner judgment or personal experiences in uncontrolled studies, with two notable exceptions, studies of mnemonics and of delayed oral production. One reflection of the difference in traditions is that cognitive psychologists assume a positivist stance with regard to the potential of instruction to generate gains in

learning, whereas theorists in second language acquisition are pessimistic concerning the potential for classroom practices to impact on language acquisition except in a superficial way.

A series of learning strategies was identified that should prove useful in second language acquisition. Some of these strategies have been used both in text processing and in second language learning, while others have been used in only one of these areas. Some of those used in reading alone have potential for use in learning a second language. Many of the strategies are designed for students to use independently and call on higher level cognitive skills, while others are embedded in the way in which prose passages are presented.

Two of the more interesting strategies with a base of empirical support are mnemonic strategies and delayed oral production. Mnemonics call upon metacognitive approaches to analyze learning requirements and develop linkages between new information and stored memories. Research on mnemonic techniques has been conducted in both reading and second language acquisition. The techniques have been used successfully with varying types of materials and students and recently have been extended beyond vocabulary learning to more general comprehension tasks using a variant of a networking analysis. The strategy nevertheless has proven difficult to use with large or even small groups except in one circumstance involving second language acquisition, and has yet to be shown to transfer to new tasks. Thus, by no means have all of the problems in applying the strategy to second language acquisition been resolved.

A delayed oral production strategy of considerable interest is the Total Physical Response (TPR) approach, which heretofore has been used only as a manipulative strategy. This strategy has an empirical base of support exclusively in the second language learning area. The focus of the strategy has been on teaching appropriate overt responses to imperative language forms, with oral production delayed until students express readiness to participate. The TPR approach is complex, however, and may be difficult to replicate except by following specific materials and teaching procedures. Further, by following the prescribed teaching procedures, a desired shift from manipulative to metacognitive strategies would never be realized. What may be more useful than a replication of prior work is the possibility of isolating components of the strategy on which controlled studies can more easily be performed, such as the use of imperative language forms accompanied by overt responses. Another possibility is to combine in a single study the mnemonic strategies, which emphasize vocabulary acquisition, and the imperative language forms, which emphasize complete grammatical structures that convey task instructions. This series of studies could continue with a test in which students trained to understand a specific task performance in a second language are subsequently requested to communicate instructions for performing the task to another learner in that language. The studies could conclude with a test of the transfer of the strategies to new tasks.

The attention given to these two strategies does not suggest that further inquiry into other topics or other learning strategies will not be fruitful. At least two additional topics are evident. First, the parallel identified between learning strategies used both in reading and second language learning reveals the generality of some of these strategies across different kinds of tasks, and indicates that analyses of transfer from use of the strategies in second language acquisition to their use in reading will be of interest. A number of studies has documented the feasibility of this line of inquiry and has indicated that training of critical listening skills will transfer to reading comprehension for similar kinds of skills and knowledge (Sticht et al., 1974). A second additional topic for consideration is to extend to second language acquisition the theoretical modeling already begun by cognitive psychologists interested in reading and learning strategies. For example, Flavell and Wellman (1977) have provided a theoretical model of memory that includes both learning strategies and metacognition among other factors that influence probable learning performance. Adaptation of this or other models in studies of learning strategies in second language acquisition should advance our understanding of the variables involved in learning and extend our capability to apply our findings to instruction.

REFERENCES

Aitken, K.C. Using cloze procedure as an overall language proficiency test. TESOL Quarterly, November 1977, 59-67.

Asher, J. J. The Total Physical Response approach to second language learning. The Modern Language Journal, 1969a, 53(1), 3-17.

Asher, J. J. The Total Physical Response technique of learning. The Journal of Special Education, 1969b, 3(3), 253-262.

Asher, J. J. Children's first language as a model for second language learning. The Modern Language Journal, 1972, 56(3), 133-139.

Asher, J. J. Children learning another language: A developmental hypothesis. Child Development, 1977, 48, 1040-1048.

Asher, J. J. Learning another language through actions: The complete teacher's guidebook. Los Gatos, CA: Skyoak Productions, 1979.

Asher, J. J. The Total Physical Response: Theory and practice. In H. Winitz (Ed.), Native language and foreign language acquisition. Annals of the New York Academy of Sciences (Volume 379). New York, NY: New York Academy of Sciences, 1981.

Asher, J. J. Learning another language through actions: The complete teacher's guidebook, Second Edition. Los Gatos, CA: Sky Oaks Productions, 1982.

Asher, J. J., and Garcia, R. The optimal age to learn a foreign language. The Modern Language Journal, 1969, 53(5), 334-341.

Asher, J. J., Kusudo, J. A., and De La Torre, R. Learning a second language through commands: The second field test. Modern Language Journal, 1974, 58(1-2), 24-32.

Asher, J. J., and Price, B. S. The learning strategy of the Total Physical Response: Some age differences. Child Development, 1967, 38(4), 1219-1227.

Atkinson, R. C. Mnemotechnics in second-language learning. American Psychologist, 1975, 30, 821-828.

Atkinson, R. C., and Raugh, M. R. An application of the mnemonic keyword method to the acquisition of Russian vocabulary. Journal of Experimental Psychology: Human Learning and Memory, 1975, 104, 126-133.

Ausubel, D. P. The use of advance organizers in the learning and retention of meaningful verbal material. Journal of Educational Psychology, 1960, 51, 267-272.

Ausubel, D. P., and Fitzgerald, D. Organizer, general background, and antecedent learning variables in sequential verbal learning. Journal of Educational Psychology, 1962, 53, 243-249.

Ausubel, D. P. Educational psychology: A cognitive view. New York, NY: Holt, Rinehart, and Winston, 1968.

Bailey, K. M. An introspective analysis of an individual's language learning experience. In R. C. Scarcella and S. D. Krashen (Eds.), Research in second language acquisition. Rowley, MA: Newbury House, 1980.

Barnes, B. R., and Clawson, E. U. Do advance organizers facilitate learning? Recommendations for further research based on an analysis of 32 studies. Review of Educational Research, 1975, 45, 637-659.

Boker, J. R. Immediate and delayed retention effects of interspersing questions in written instructional passages. Journal of Educational Psychology, 1974, 66, 96-98.

Boyd, W. M. Repeating questions in prose learning. Journal of Educational Psychology, 1973, 64, 31-38.

Brophy, J. E. Teacher behavior and its effects. Journal of Teacher Education, 1979, 71(6), 733-750.

Brown, G. Understanding spoken language. TESOL Quarterly, December 1978, 271-283.

Bull, B. L., and Wittrock, M. C. Imagery in the learning of verbal definitions. British Journal of Educational Psychology, 1973, 43, 289-293.

Cathcart, R. W., Strong, M. A., and Fillmore, L. W. The social and linguistic behavior of good language learners. In C. A. Yorio, K. Perkins, and J. Schachter (Eds.), On TESOL 79: The learner in focus. Washington, DC: TESOL, 1979.

Chamot, A. U. Listening skills in the elementary ESL class. In H. D. Brown, C. A. Yorio and R. H. Crymes (Eds.), On TESOL '77-Teaching and learning English as a second language: Trends in research and practice. Washington, DC: TESOL, 1977.

Chamot, A. U. ESL speaking skills in the elementary bilingual classroom. In C. A. Yorio, K. Perkins, and J. Schachter (Eds.), On TESOL '79 - - The learner in focus. Washington, DC: TESOL, 1979.

Chamot, A. U. Applications of second language acquisition research to the bilingual classroom. Focus 8. Rosslyn, VA: National Clearinghouse for Bilingual Education, 1981.

Chamot, A. U., and Chamot, G.A. Journal of a ten year old second language learner. In R. V. Padilla (Ed.), Theory, technology, and public policy in bilingual education; 1982 NABE conference

proceedings. Rosslyn, VA: National Clearinghouse for Bilingual Education, 1983.

Chastain, K. Developing second-language skills: Theory to practice, Second Edition. Chicago, IL: Rand McNally College, 1976.

Corder, S. P. Error analysis and interlanguage. Oxford, England: Oxford University Press, 1981.

Cummins, J. The construct of language proficiency in bilingual education. In J. E. Alatis (Ed.), Current issues in bilingual education. Georgetown University Round Table on Languages and Linguistics 1980. Washington, DC: Georgetown University Press, 1980.

Cummins, J. Tests, achievement, and bilingual students. Focus 9. Rosslyn, VA: National Clearinghouse for Bilingual Education, 1982.

Curran, C. A. Counseling-learning in second languages. Apple River, IL: Apple River Press, 1976.

Dale, P. S. Language development: Structure and function. New York: Holt, Rinehart, and Winston, 1976.

Dansereau, D. F. Learning strategy research. Unpublished manuscript, Texas Christian University, 1982.

Dansereau, D. F. The development of a learning strategies curriculum. In H. F. O'Neil (Ed.), Learning strategies. New York: Academic Press, 1978.

Dansereau, D. F., Actkinson, T. R., Long, G. L., and McDonald, B. Learning strategies: A review and synthesis of the current literature (AFHRL-TR-74-70, Contract F41609-74-C-0013). Lowry Air Force Base, Colorado, 1974. (AD-A007722).

Dansereau, D. F., Long, G. L., McDonald, B., and Actkinson, T. R. Learning strategy inventory development and assessment (AFHRL-TR-74-40, Contract F41609-74-C-0013). Brooks Air Force Base, Texas, 1975a.

Dansereau, D. F., Long, G. L., McDonald, B., Actkinson, T. R., Ellis, A. M., Collins, K. W., Williams, S., and Evans, S. H. Effective learning strategy training program: Development and assessment (AFHRL-TR-75-41, Contract F41609-74-C-0013). Lowry Air Force Base, Colorado, 1975b. (AD-A014722)

Delaney, H. D. Interaction of individual differences with visual and verbal elaboration instructions. Journal of Educational Psychology, 1978, 70, 306-318.

Doctorow, M. J., Wittrock, M. C., and Marks, C. B. Generative processes in reading comprehension. Journal of Educational Psychology, 1973, 70, 109-118.

Duchastel, P. Learning objectives and the organization of prose. Journal of Educational Psychology, 1979, 71, 100-106.

Duell, O. K. Effect of type of objective, level of test questions, and the judged importance of tested materials upon posttest performance. Journal of Educational Psychology, 1974, 66, 225-232.

Dulay, H. C., and Burt, M. K. Creative construction in second language learning and teaching. In M. K. Burt and H. C. Dulay (Eds.), New directions in second-language learning and teaching. Washington, DC: TESOL, 1975.

Dunkel, P., and Pialorsi, F. Advanced listening comprehension: Developing aural and note-taking skills. Rowley, MA: Newbury House, 1982.

Eisenstein, M., Bailey, N., and Madden, C. It takes two: Contrasting tasks and contrasting structures. TESOL Quarterly, 1982, 16(3), 381-393.

Faw, H. W., and Waller, T. G. Mathemagenic behaviors and efficiency from learning from prose materials: Review, critique, and recommendations. Review of Educational Research, 1976, 46, 691-720.

Fillmore, L. W. The second time around: Cognitive and social strategies in second language acquisition. Ph.D. dissertation. Stanford University, 1976.

Fillmore, L. W. Learning a second language: Chinese children in the American classroom. In J. E. Alatis (Ed.), Roundtable on language and linguistics: Current issues in bilingual education. Washington, DC: Georgetown University Press, 1980.

Flavell, J. H., and Wellman, H. M. Metamemory. In R. V. Kail and J. W. Hagen (Eds.), Perspectives on the development of memory and cognition. Hillsdale, NJ: Lawrence Erlbaum, 1977.

Ford, N. Recent approaches to the study and teaching of 'effective learning' in higher education. Review of Educational Research, 1981, 51(3), 345-377.

Galyean, B. A confluent design for language teaching. TESOL Quarterly II, No. 2, 1977, 143-156.

Gary, J. O. and Gary, N. Comprehension-based language instruction: Theory. In H. Winitz (Ed.), Native language and foreign language acquisition, Annals of the New York Academy of Sciences, (Vol. 379). New York, NY: New York Academy of Sciences, 1981.

Gattegno, C. Teaching foreign languages in schools: The silent way. New York, NY: Educational Solutions, 1972.

Glynn, S. M., and Di Vesta, F. J. Outline and hierarchial organization as aids for study and retrieval. Journal of Educational Psychology, 1977, 69, 89-95.

Good, T. L. Teacher effectiveness in the elementary school. Journal of Teacher Education, 1979, 30(2)), 52-64.

Griffith, D. A review of the literature on memory enhancement: The potential and relevance of mnemotechnics for military training. Technical Report No. 436. Army Research Institute for the Behavioral and Social Sciences, Fort Hood, 1980.

Gutstein, S.H., Kreeft, J., and Meloni, C. Experiencing "real English": Writing a dialogue journal. Paper presented at WATESOL Convention, George Mason University, Fairfax, VA, 1982.

Guttman, J., Levin, J. R., and Pressley, M. Pictures, partial pictures, and young children's oral prose learning. Journal of Educational Psychology, 1977, 69, 473-480.

Hakuta, K. Becoming bilingual at age 5: The story of Uguisu. B. A. honors thesis, Harvard University, Department of Psychology and Social Relations, 1975.

Hosenfeld, C. Learning about learning: Discovering our students' strategies. Paper presented at ACTFL Convention, 1974.

Howe, M. J. A. Using students' notes to examine the role of the individual learner in acquiring meaningful subject matter. Journal of Educational Research, 1970, 64, 61-63.

Jones, B. F. Embedding structural information and strategy instructions within mastery learning units. Paper presented at the annual meeting of the International Reading Association, St. Louis, May 1980.

Jones, B. F., and Smart, D. Embedding learning strategies in well-marked texts for military occupational specialists training materials. Proposal submitted to the U.S. Army Research Institute for Behavioral and Social Sciences through InterAmerica Research Associates, Basic Skills Resource Center, May 1982.

Kane, J. H., and Anderson, R. C. Depth of processing and interference effects in the learning and remembering of sentences. Journal of Educational Psychology, 1978, 70, 626-635.

Kaplan, R., and Simmons, F. G. Effects of instructional objectives used as orienting stimuli or as summary/review upon prose learning. Journal of Educational Psychology, 1974, 66, 614-622.

Kintsch, W., and van Dijk, T. A. Toward a model of comprehension and production. Psychological Review, 1978, 85(5), 363-394.

Krashen, S. The input hypothesis. In J. E. Alatis (Ed.), Current issues in bilingual education. Georgetown University Round Table on Languages and Linguistics. Washington, DC: Georgetown University Press, 1980.

Krashen, S. The monitor model for second language acquisition. In R. C. Gingras (Ed.), Second language acquisition and foreign language teaching. Washington, DC: Center for Applied Linguistics, 1978.

Kunihira, S., and Asher, J. J. The strategy of the Total Physical Response: An application to learning Japanese. International Review of Applied Linguistics, 1965, 3(4), 277-289.

Levin, J. R. Inducing comprehension in poor readers: A test of a recent model. Journal of Educational Psychology, 1973, 65, 19-24.

Levin, J. R. The mnemonic '80s: Keywords in the classroom. Educational Psychologist, 1981, 16(2), 65-82.

Levin, J. R., Kessler, J., Miller, G. E., and Bartell, N. P. More on how (and how not) to remember the States and their capitals. Working Paper No. 306. Madison, WI: Wisconsin Research and Development Center for Individualized Schooling, University of Wisconsin, 1981.

Levin, J. R., McCormick, C. B., and Dretzke, B. J. Investigation of a combined mnemonic strategy for teaching the order of U.S. Presidents. Working Paper No. 307. Madison, WI: Wisconsin Research and Development Center for Individualized Schooling, University of Wisconsin, 1981.

Levin, J. R., and Pressley, M. Understanding mnemonic imagery effects: A dozen "obvious" outcomes. Educational Technology, in press.

Levin, J. R., Pressley, M., McCormick, C. B., Miller, G. E., and Shriberg, L. K. Assessing the classroom potential of the keyword method. Journal of Educational Psychology, 1979, 71, 583-594.

Levin, J. R., Shriberg, L. K., Miller, G. E., McCormick, C. B., and Levin, B. B. The keyword method as applied to elementary school children's social studies content. Working Paper No. 265. Madison, WI: Wisconsin Research and Development Center for Individualized Schooling, 1979.

Mayer, R. E. Advance organizers that compensate for the organization of text. Journal of Educational Psychology, 1978, 70, 880-886.

Mayer, R. E. Can advance organizers influence meaningful learning? Review of Educational Research, 1979, 49, 371-383.

McCombs, B. L. Enhancements to motivational skill training for military technical training students. Proposal submitted to the U.S. Army Research Institute for the Behavioral and Social

Sciences through InterAmerica Research Associates, Basic Skills Resource Center, May 1982.

Mellgren, L., and Walker, M. New horizons in English, Second Edition. Reading, MA: Addison-Wesley, 1980.

Naiman, N. The use of elicited imitation in second language acquisition research. Working Papers in Bilingualism, March 1974.

Nord, J. R. Developing listening fluency before speaking: An alternative paradigm. System 8, 1980, 1, 1-22.

Paris, S. G., Lindauer, B. K., and Cox, G. L. The development of inferential comprehension. Child Development, 1977, 48, 1728-1733.

Peper, R. J., and Mayer, R. E. Note taking as a generative activity. Journal of Educational Psychology, 1978, 70, 514-522.

Postovsky, V.A. Effects of delay in oral practice at the beginning of second language learning. Modern Language Journal, 1974, 58 229-239.

Pressley, G. M. Mental imagery helps eight-year-olds remember what they read. Journal of Educational Psychology, 1976, 68, 355-359.

Pressley, M., Levin, J. R., and Delaney, H. D. The mnemonic keyword method. Review of Educational Research, 1982, 52(1), 61-91.

Pressley, M., Levin, J. R., Digdon, N., Bryant, S. L., McGivern, J. E., and Ray, K. Re-examining the "limitations" of the mnemonic keyword method. Working Paper No. 329. Madison, WI: Wisconsin Center for Education Research, University of Wisconsin, 1982.

Pressley, M., Levin, J. R., Kuiper, N. A., Bryant, S. L., and Michener, S. Mnemonic versus nonmnemonic vocabulary-learning strategies: Putting "depth" to rest. Working Paper No. 312. Madison, WI: Wisconsin Research and Development Center for Individualized Schooling, University of Wisconsin, 1981.

Pressley, M., Samuel, J., Hershey, M. M., Bishop, S. L., and Dickinson, D. Use of mnemonic techniques to teach young children foreign language vocabulary. Contemporary Educational Psychology, 1981, 6, 110-116.

Raugh, M. R., and Atkinson, R. C. A mnemonic method for learning a second-language vocabulary. Journal of Educational Psychology, 1975, 67, 1-16.

Raugh, M. R., Schupbach, R. D., and Atkinson, R. C. Teaching a large Russian language vocabulary by the mnemonic keyword method. Instructional Science, 1977, 6, 199-221.

Rickards, J. P., and August, G. J. Generative underlining strategies in prose recall. Journal of Educational Psychology, 1975, 67, 860-865.

Rigney, J. W. Learning strategies: A theoretical perspective. In H. F. O'Neil (Ed.), Learning strategies. New York: Academic Press, 1978.

Rivers, W. M. Learning a sixth language: An adult learner's daily diary, Appendix B. In W. M. Rivers (Ed.), Teaching foreign-language skills, Second Edition. Chicago, IL: University of Chicago Press, 1981.

Rosenshine, B. V. Content, time, and direct instruction. In P. L. Peterson and H. J. Walberg (Eds.), Research on teaching: Concepts, findings, and implications. Berkeley, CA: McCutchan, 1979, 28-56.

Ross, H. S., and Killey, J. C. The effects of questioning on retention. Child Development, 1977, 48, 312-314.

Royer, P. N. Effects of specificity and position of written instructional objectives on learning from lecture. Journal of Educational Psychology, 1977, 69, 40-45.

Ruch, M. D., and Levin, J. R. Pictorial organization versus verbal repetition of children's prose: Evidence for processing differences. AV Communication Review, 1977, 25, 269-280.

Sagaria, S. D., and Di Vesta, F. J. Learner expectations induced by adjunct questions and the retrieval of intentional and incidental information. Journal of Educational Psychology, 1978, 70, 280-288.

Saville-Troike, M., McClure, E., and Fritz, M. Communicative tactics in children's second language acquisition. Paper presented at the University of Wisconsin symposium on Universals on Second Language Acquisition, Milwaukee, March 1982.

Schumann, F. M. Diary of a language learner: A further analysis. In R. C. Scarcella and S. D. Krashen (Eds.), Research in second language acquisition. Rowley, MA: Newbury House, 1980.

Shumann, F. M., and Schumann, J. H. Diary of a language learner: An introspective study of second language learning. In H. D. Brown, C. A. Yorio, and R. H. Crymes (Eds.), On TESOL '77 teaching and learning English as a second language: Trends in research and practice. Washington, DC: TESOL, 1977.

Slobin, C. I. and Welsh, C. A. Elicited imitation as a research tool in developmental psycholinguistics. In C. Ferguson and D. I. Slobin (Eds.), Studies in child language development. New York: Holt, Rinehart, and Winston, 1973.

Staton, J., Shuy, R., and Kreeft, J. Analysis of dialogue journal writing as a communicative event. Final Report to the National Institute of Education, 1982.

Sticht, T. G. The acquisition of literacy by children and adults. Prepared for the Second Delaware Symposium on Curriculum, Instruction, and Learning: The Acquisition of Reading. University of Delaware, 1975a.

Sticht, T. G. (Ed.), Reading and working: A functional literacy anthology. Alexandria, VA: HUMRO, 1975b.

Sticht, T. G., Beck, L. J., Hauke, R. N., Kleiman, G. M., and James, J. H. Auding and reading: A developmental model. Alexandria, VA: HUMRO, 1974.

Sticht, T. G., and James, J. H. Listening to language and looking at language. In S. Wanat, H. Singer, and M. Kling (Eds.), Extracting meaning from written language. International Reading Association, 1973.

Streiff, V. Cloze in the classroom, with notes on needed research. Bilingual Education Paper Series, May 3. Los Angeles, CA: Evaluation, Dissemination, and Assessment Center, California State University, 1981.

Tarone, E. Some thoughts on the notion of communication strategy. TESOL Quarterly, 1981, 15(3), 285-295.

Taylor, H. M. Learning to listen to English. TESOL Quarterly, 1981, 15(1), 41-50.

Telatnik, M. A. Developing a culture/communication course with videotapes on cultural misunderstandings: An update. Paper presented at Colorado TESOL Convention, Denver, 1979.

Tenenbaum, A. B. Task-dependent effects of organization and context upon comprehension of prose. Journal of Educational Psychology, 1977, 69, 528-536.

Terrell, T. D. The natural approach in bilingual education. In Office of Bilingual Education, California State Department of Education, Schooling and language minority students: A theoretical framework. Los Angeles, CA: Evaluation, Dissemination, and Assessment Center, California State University, Los Angeles, 1981.

Ventriglia, L. Conversations of Miguel and Maria: How children learn a second language. Reading, MA: Addison-Wesley, 1982.

Walker, M. Yes! English for children; Young English Series, New Edition. Reading, MA: Addison-Wesley, 1983.

Weiland, A., and Kingsbury, S. J. Immediate and delayed recall of lecture material as a function of notetaking. Journal of Educational Research, 1979, 72(4), 228-230.

Weinstein, C. E. Elaboration skills as a learning strategy. In H. F. O'Neil (Ed.), Learning strategies. New York: Academic Press, 1978.

Wittrock, M. C. Learning as a generative process. Educational Psychologist, 1974, 1, 87-95.

Wittrock, M. C. Generative reading comprehension. Unpublished manuscript, University of California at Los Angeles, 1982.

Wittrock, M. C., and Carter, J. Generative processing or hierarchically organized words. American Journal of Psychology, 1975, 88, 489-501.

Wittrock, M. C., Marks, C. B., and Doctorow, M. J. Reading as a generative process. Journal of Educational Psychology, 1975, 67, 484-489.

Wolff, P., and Levin, J. R. The role of overt activity in children's imagery production. Child Development, 1972, 43, 537-547.

Yorkey, R. C., Barrutia, R., Chamot, A. U., et al. English for international communication, New Edition. Boston, MA: Heinle and Heinle (in press).